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10/520,000	08/05/2005	Gerd Mossakowski	P-57 MG	5129

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EXAMINER
LERNER, MARTIN

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No.	Applicant(s)
	10/520,000	MOSSAKOWSKI, GERD
	Examiner	Art Unit
	Martin Lerner	2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 to 7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 to 7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 1, lines 1 to 12, reference to claim 1 should be deleted. Any issued claims may not reflect the current claims.

On page 1, line 14, "[rate]" should be removed from parentheses.

On page 2, lines 10 to 11, reference to claim 1 should be deleted. Any issued claims may not reflect the current claims.

In the Abstract, line 10, "received" should be "receiver".

Appropriate correction is required.

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method of Prioritizing Transmission of Spectral Components of Audio Signals

Claim Objections

3. Claims 1 to 7 are objected to because of the following informalities:

In claim 1, "the term "pixel" should be deleted. It is understood that there is an analogy between prioritization of transmission of pixels for imaging coding and of transmission of spectral components for audio coding. However, there are, in fact, no

pixels present for audio coding, so it is misdescriptive to suggest that the transmission method involves pixels. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 to 3 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by *Atlas et al.*

Regarding independent claim 1, *Atlas et al.* discloses a method for multiresolution scalable audio coding, comprising:

"resolving the audio signal into a number of n spectral components" – a normalized audio input signal is processed by a 2D transform; the first transform produces time varying spectral estimates (column 5, line 66 to column 6, line 4: Figure 1: Step 30); a two dimensional transform process starts with a filter bank, and a base transform process 154 provides a matrix of time samples having frequency indices k (column 8, line 1 to column 9, line 13: Figure 2);

"storing of the resolved audio signals in a two-dimensional array with a multiplicity of fields, with frequency and time as dimensions and the amplitude as

particular value to be entered in the field" – the transforms produce a magnitude matrix (column 6, lines 2 to 4: Figure 1); a 2D time frequency distribution 156 has a plurality of frequency bins across a vertical axis, and a plurality of time windows across a horizontal axis (column 9, lines 5 to 13: Figure 2); magnitude matrix contains coefficients that represent an approximate mean spectral density of the input signal, or an implicit power spectral density (column 6, lines 5 to 17 column 9, lines 56 to 60); the mean spectral density is represented by magnitude values X_m^D for each element of the matrix illustrated in Figure 2, where the magnitude values are equivalent to amplitudes;

"forming of groups from each individual field and at least two fields of the array adjacent to this field" – the two-dimensional transform is applied to an audio signal as two auditory notes of a glockenspiel musical instrument; a first note starts at time zero, and a second note begins approximately 60 ms later (column 10, lines 13 to 25: Figures 3A and 3B); thus, the transformed audio signal is applied at least to a series of notes, which are "groups", where at least one magnitude matrix represents each of the groups; implicitly there are at least three adjacent notes ("at least two fields of the array adjacent to this field"), even though only two are expressly disclosed;

"assigning a priority to the individual groups, the priority of one group becoming greater the greater the amplitudes of the groups values and/or the greater the amplitude differences of the values of a group and/or the closer the group is to the current time" – a sudden onset of second note tones at approximately 4.5 kHz and 9kHz results in significantly more energy and corresponding modulation frequencies; the unusually large extent of the modulation frequency results from an abrupt change of note ("the

greater the amplitude differences of the values of a group") (column 10, lines 35 to 40); matrices are quantized and priority ordered into a data packet, with the least perceptually relevant information at the end of the packet (Abstract); by prioritizing the MSD function and matrices data in the data packet, the most perceptually relevant information can be sent, stored, or otherwise utilized, using the available channel capacity (column 3, lines 41 to 53);

"transmitting the groups to the receiver in the sequence of their priority" – matrices are quantized and priority ordered into a data packet, with the least perceptually relevant information at the end of the packet (Abstract); the prioritized coefficients are then encoded into the data packet in priority order, so that the most perceptually relevant coefficients are adjacent to the beginning of the data packet and the least perceptually relevant information are adjacent to the end of the packet (column 3, lines 41 to 53); perceptual ordering allows for fine grain scalability, so that the most important information is transmitted to the decoder when the bandwidth is limited; the highest priority elements of the magnitude and phase matrix are put into the bit stream packet first, where low modulation frequencies have priority over higher modulation frequencies (column 11, line 61 to column 12, line 3); thus, magnitude information is sent in an ordered sequence of their priority, with the most important information at the beginning of the packet, and the least important information is placed at the end of the packet, or not transmitted if the bandwidth is low.

Regarding claim 2 and 3, *Atlas et al.* discloses that magnitude matrices are priority ordered so that the least relevant information may be placed at the end of the packet (Abstract; column 3, lines 44 to 49); depending upon the channel capacity, the least perceptually relevant information may not be added to the data packet before transmission; alternatively, the least perceptually relevant information may be truncated from the data packet (column 3, lines 50 to 57); fine grain scalability can be achieved by truncating a frame at any point above a predefined minimum threshold before transmission determined by available bandwidth, with a minimal adverse impact on the perceived quality of the perceptual data (column 12, lines 4 to 19); thus, either "the entire audio signal . . . is processed and transmitted in its entirely" by placing the least relevant information at the end of the packet, or "only a portion of the audio signal is processed and transmitted" when the least perceptually relevant information may not be added to, or is truncated from, the data packet as determined by available bandwidth.

Regarding claim 7, *Atlas et al.* discloses a decoder 200 receives a packet, and reverses the encoding process, yielding standard PCM code for playback (column 11, lines 10 to 35: Figure 9); applications include listening, sampling, or purchasing music via electronic distribution systems or broadcast systems, or for progressive playback of music (column 13, lines 1 to 59).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 4 to 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Atlas et al.* in view of *Levine et al.*

Concerning claims 4 and 5, *Atlas et al.* discloses a two-dimensional transform process involving a time domain aliasing canceling filter bank, a modified discrete cosine transform (MDCT), and a modified discrete sine transform (MDST) for producing magnitude values X_m^D for each element of the matrix. (Column 8, Line 1 to Column 9, Line 60: Figure 2) A modified discrete cosine transform (MDCT), and a modified discrete sine transform (MDST) are somewhat more complex representations of a Fast Fourier Transform (FFT) and a number n of frequency selective filters, because *Atlas et al.* is concerned with preserving phase information. However, *Atlas et al.* does disclose a filter bank, which is equivalent to "a number n of frequency selective filters." In any event, it is well known that there are a plurality of art recognized alternative ways of transforming a signal into its individual frequency components by Fourier analysis, and that filter banks ("a number n of frequency selective filters") and a Fast Fourier Transform are among the most common alternatives. Specifically, *Levine et al.* teaches a system and method for multiresolution scalable audio signal encoding, where a multi-

complementary filter bank 132 splits an input audio signal into several octave-band signals 136 on lines 138-1 to 138-n for bands 1 to n. (Column 5, Line 19 to Figure 6, Line 17: Figure 1: Table 1) Then, a sinusoidal component identifier 140 is implemented using a short time frame FFT to identify spectral peaks within each band signal 136. Sinusoidal components parameters 142 are produced by the FFT analysis to give a parameter tuple representing frequency, amplitude, and phase of each identified spectral component. (Column 6, Lines 18 to 50: Figure 1) An objective is to identify deterministic or sinusoidal components, transient components representing the onset of notes or other events in an audio signal, and stochastic components, so that compressed encoded audio data can meet a specified transmission bandwidth limit. It would have been obvious to one having ordinary skill in the art to substitute art recognized alternatives of an FFT and a number n of frequency selective filters as taught by *Levine et al.* for the filter bank, MDCT, and MDST of *Atlas et al.* for a purpose of reducing bandwidth by identifying transient components representing the onset of notes for an audio signal.

Concerning claim 6, *Atlas et al.* omits interpolation at a receiver of values still to be transmitted from already available values due to the assignment prioritization. However, it is fairly well known to interpolate lost packets from available data in audio coders operating according to a standard of MPEG. Specifically, *Levine et al.* teaches a system and method for multiresolution scalable audio signal encoding, where a missing packet can be estimated by interpolating from values received in the data packets before and after a lost packet when a packet happens to be lost in transmission.

(Column 13, Lines 13 to 20) An objective is to identify deterministic or sinusoidal components, transient components representing the onset of notes or other events in an audio signal, and stochastic components, so that compressed encoded audio data can meet a specified transmission bandwidth limit. It would have been obvious to one having ordinary skill in the art to interpolate values still to be transmitted from already available values as taught by *Levine et al.* for a method of multiresolution scalable audio coding of *Atlas et al.* for a purpose of reducing bandwidth by identifying transient components representing the onset of notes for an audio signal.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

Hardwick et al., Putzolu, Ekudden et al., Lapicque, Yong, Hutchins, Henry, Jr., Rahardja et al. ("Perceptually Prioritized Bit-Plane Coding for High-Definition Advanced Audio Coding"), Korhonen ("Error robustness scheme for perceptually coded audio based on interframe shuffling of samples"), and Babich et al. ("Source-matched channel coding and networking techniques for mobile communications") disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (571) 272-7608. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ML
10/18/07

Martin Lerner
Examiner
Group Art Unit 2626